What is claimed is:

1. A system for dividing a single mass flow into two or more secondary flows of desired ratios, comprising:

A) an inlet adapted to receive the single mass flow;

B) at least two secondary flow lines connected to the inlet, each flow line including,

a flow meter measuring flow through the flow line and providing a signal indicative of the measured flow, and

a valve controlling flow through the flow line based upon a signal indicative of desired flow rate;

C) a user interface adapted to receive at least one desired ratio of flow; and

D) a controller connected to the flow meters, the valves, and the user interface, and programmed to,

receive the desired ratio of flow through the user interface,

receive the signals indicative of measured flow from the flow meters,

calculate an actual ratio of flow through the flow lines based upon the measured flow,

compare the actual ratio to the desired ratio,

calculate the desired flow through at least one of the flow lines if the actual ratio is unequal to the desired ratio, and

provide a signal indicative of the desired flow to at least one of the valves.

2. A system according to claim 1, wherein the flow meters are thermal-based.

3. A system according to claim 1, wherein:

the flow lines comprise first and second flow lines; and

the controller is programmed to,

provide a signal to the valve of the first flow line indicative of a first desired flow,

calculate a second desired flow if the actual ratio is unequal to the desired ratio, and

provide a signal to the valve of the second flow line indicative of the second desired flow.

4. A system according to claim 3, wherein the first desired flow causes the valve of the first line to fully open.

5. A system according to claim 3, wherein the ratio of flow is equal to the flow through the second flow line divided by the flow through the first flow line.

6. A system according to claim 5, wherein an allowable range for the desired ratio of flow is between about 1 and about 10.

7. A system according to claim 1, wherein:

the flow lines comprise first, second and third flow lines;

the user interface is adapted to receive a desired ratio of flow for the second and the first flow lines, and a desired ratio of flow for the third and the first flow lines; and

the controller is programmed to,

provide a signal to the first valve indicative of a first desired flow,

receive the desired ratios of flow through the user interface,

receive the signals indicative of measured flow from the flow meters,

calculate an actual ratio of flow for the second and the first flow lines based upon the measured flows through the second and the first flow lines,

calculate a second desired flow if the actual ratio for the second and the first flow lines is unequal to the desired ratio for the second and the first flow lines,

provide a signal to the valve of the second flow line indicative of the second desired flow,

calculate an actual ratio of flow for the third and the first flow lines based upon the measured flows through the third and the first flow lines,

calculate a third desired flow if the actual ratio for the third and the first flow lines is unequal to the desired ratio for the third and the first flow lines, and

provide a signal to the valve of the third flow line indicative of the third desired flow.

8. A system according to claim 7, wherein the first desired flow causes the valve of the first line to fully open.

9. A system according to claim 7, wherein the first ratio of flow is equal to the flow through the second flow line divided by the flow through the first flow line, and the second ratio of flow is equal to the flow through the third flow line divided by the flow through the first flow line.

10. A system according to claim 9, wherein an allowable range for each desired ratio of flow is between about 1 and about 10.

11. A system according to claim 1, wherein the desired flow is substantially equal to $K_p(\alpha - \alpha_{sp}) + K_i\int(\alpha - \alpha_{sp})_{dt}$, wherein K_p is a proportional gain, K_i is an integral gain, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

12. A system according to claim 1, further comprising a pressure sensor measuring pressure in one of the inlet and the secondary flow lines, and connected to the controller to provide the pressure measurement to the controller.

13. A system according to claim 12, wherein the pressure sensor measures pressure in the inlet.

14. A system according to claim 13, wherein the controller is programmed to provide a signal indicative of the desired flow to the valve of the first flow line substantially equal to $K_{p\alpha}(\alpha - \alpha_{sp}) + K_{i\alpha}\int(\alpha - \alpha_{sp})_{dt}$, wherein K_p is a proportional gain for ratio control, K_i is an integral gain for ratio control, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

15. A system according to claim 13, wherein the controller is programmed to provide a signal indicative of the desired flow to the valve of the second flow line substantially equal to $K_p(P_{in} - P_t) + K_i\ (P_{in} - P_t)_{dt}$, wherein K_p is a proportional gain for pressure control, K_i is an

integral gain for pressure control, P_{in} is the measured inlet pressure, and P_t is an operating pressure threshold.

16. A method for dividing a single mass flow into two or more secondary mass flows of desired ratios, comprising:

A) dividing a single mass flow into at least two flow lines;

B) measuring mass flow through each flow line;

C) receiving at least one desired ratio of mass flow;

D) calculating an actual ratio of mass flow through the flow lines based upon the measured flows;

E) calculating a desired flow through at least one of the flow lines if the actual ratio does not equal the desired ratio; and

F) regulating the flow line to the desired flow.

17. A method according to claim 16, wherein:

the single mass flow is divided into first and second flow lines;

the first flow line is regulated to a first desired flow;

a second desired flow is calculated using the desired ratio and the first desired flow if the actual ratio is unequal to the desired ratio; and

the second flow line is regulated to the second desired flow.

18. A method according to claim 17, wherein the first desired flow causes the first line to be fully open.

19. A method according to claim 17, wherein the ratio of flow is equal to the flow through the second flow line divided by the flow through the first flow line.

20. A method according to claim 21, wherein an allowable range for the desired ratio of flow is between about 1 and about 10.

21. A method according to claim 16, wherein:

the single mass flow is divided into first, second and third flow lines;

first and second desired ratios of mass flow are received;

the first flow line is regulated to a first desired flow;

a second desired flow is calculated using the first desired ratio and the first desired flow if the actual ratio of the first and the second flow lines is unequal to the desired first ratio;

the second flow line is regulated to the second desired flow;

a third desired flow is calculated using the second desired ratio and the first desired flow if the actual ratio of the first and the third flow lines is unequal to the desired second ratio; and

the third flow line is regulated to the third desired flow.

22. A method according to claim 21, wherein the first desired flow causes the first line to be fully open.

23. A method according to claim 21, wherein the ratios of flow of the first and the second flow lines are equal to the flow through the second flow line divided by the flow through

the first flow line, and the ratios of flow of the first and the third flow lines are equal to the flow through the third flow line divided by the flow through the first flow line.

24. A method according to claim 23, wherein an allowable range for each of the desired ratios of flow is between about 1 and about 10.

25. A method according to claim 16, wherein mass flows are measured using thermally-based flow meters.

26. A method according to claim 16, wherein the desired flow is substantially equal to $K_p(\alpha - \alpha_{sp}) + K_i\int(\alpha - \alpha_{sp})_{dt}$, wherein K_p is a proportional gain, K_i is an integral gain, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

27. A method according to claim 16, further comprising measuring pressure in one of the inlet and the secondary flow lines.

28. A method according to claim 27, wherein pressure in the inlet is measured.

29. A method according to claim 28, wherein the desired flow in one of the flow lines is substantially equal to $K_{p\alpha}(\alpha - \alpha_{sp}) + K_{i\alpha}\int(\alpha - \alpha_{sp})_{dt}$, wherein K_p is a proportional gain for ratio control, K_i is an integral gain for ratio control, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

30. A method according to claim 28, wherein the desired flow in one of the flow lines is substantially equal to $K_p(P_{in} - P_t) + K_i \int(P_{in} - P_t)_{dt}$, wherein K_p is a proportional gain for pressure control, K_i is an integral gain for pressure control, P_{in} is the measured inlet pressure, and P_t is an operating pressure threshold.